

Warmup:

How many different license plates can the state of Colorado have using the standard Colorado license plate?

e.g. 723-BKW

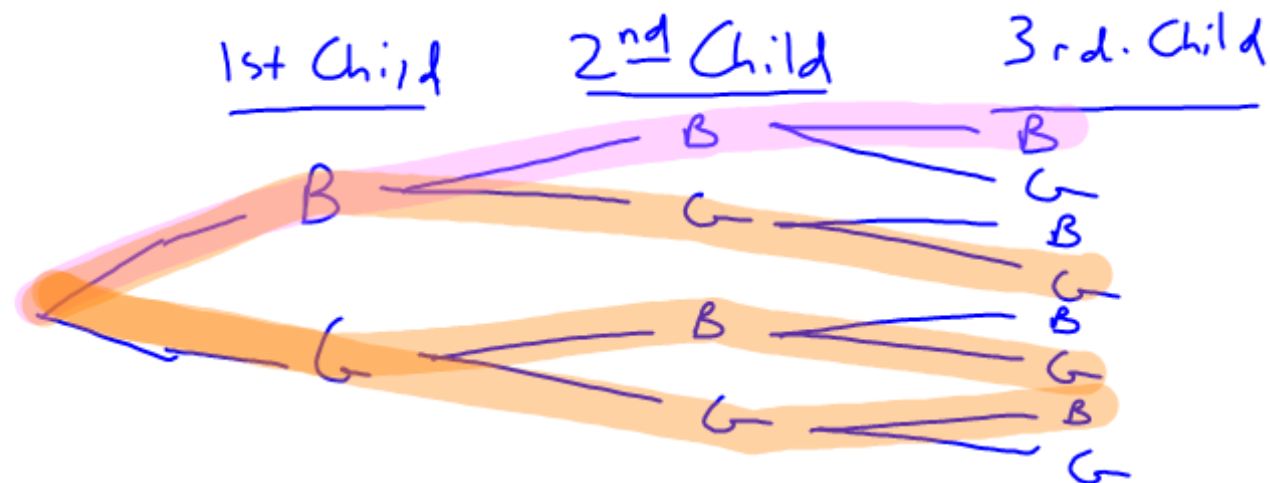
$$10 \cdot 10 \cdot 10 \cdot 26 \cdot 26 \cdot 26 \approx 17 \text{ mil} +$$

What if Colorado did not allow any repeats of letters or numbers in their license plates?

$$9 \cdot 9 \cdot 9$$

$$10 \cdot 9 \cdot 8 \cdot 26 \cdot 25 \cdot 24$$

HW
①



$$2 \times 2 \times 2 =$$

8 possible
sample space

2 girls, 1 boy $\Rightarrow \frac{3}{8}$

at least 2 girls? $\Rightarrow \frac{4}{8} = \frac{1}{2}$

BBB
 BBG
 BGB
 BGG
 GBB
 GBG
 GGB
 GGG

① P, S, O, M, A

PS	SO	OM	MA
PO	SM	OA	
PM	SA		
PA			

2 { PS
SP

$$5C_2 \rightarrow 5 \cdot 4 = \frac{20}{2} = 10$$

$$4 + 3 + 2 + 1 = 10$$

5 toppings 3 toppings/pizza

$${}_5C_3 \Rightarrow 5 \cdot 4 \cdot 3 = \frac{60}{6} = 10$$

P	S	A
P	A	S
S	A	P
S	P	A
A	S	P
A	P	S

$$3 \cdot 2 \cdot 1 = 6$$

$$\frac{5!}{3!} = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$

③

$$\text{Jon } {}_7C_2 = \frac{7 \cdot 6}{2! = 2 \cdot 1 = 2} = \frac{42}{2} = 21$$

$$\text{Joh } {}_7C_3 = \frac{7 \cdot \cancel{6} \cdot 5}{3! = 3 \cdot 2 \cdot 1 = 6} = 35$$

③a

$${}_9C_4 = \frac{9 \cdot \cancel{8} \cdot 7 \cdot \cancel{6}}{4! = 4 \cdot \cancel{3} \cdot \cancel{2} \cdot 1} = 126$$

$${}_6C_5 = \frac{6 \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2}}{5! = 5 \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot 1} = 6$$

$${}_{12}C_{11} = 12$$

- 1) Baskin-Robbins advertises that they have 31 flavors. How many different 3 scoop cones can be made if each scoop is a different flavor and the order in which the flavors are placed on the cone matters; i.e. a chocolate, strawberry, vanilla cone is different than a strawberry, chocolate, vanilla cone? How many different 3 scoop bowls can be made if the order now does not matter?

$$\text{CONE} \Rightarrow 31 \cdot 30 \cdot 29$$

$$\text{BOWL} \Rightarrow \frac{31 \cdot 30 \cdot 29}{3! = 3 \cdot 2}$$